Town of Lunenburg

17 Main Street, P.O. Box 135
Lunenburg, MA 01462-0135
978.582.4139
FAX 978.582.4148

11/10/11

Lunenburg Finance Committee
Minutes
October 27, 2011

Location: Town Hall
Present: Brian Laffond, Martha McDonald, Mark Erickson, John Male, Barbara Reynolds, Scott Gile

1) Meeting called to order by the Chairman at 7:01 PM
2) Review Minutes
   - BL made a motion to accept the minutes of the 10/6/11 meeting as submitted; BR seconded; all approved
   - JM made a motion to accept the minutes of the 10/13/11 meeting as submitted; SG seconded; all approved
3) Committee/Department Reports
   - Capital Planning – committee met today; reviewed Form B's that have been submitted; reviewed list of all items over $10k
   - Monty Tech – total student enrollment of 1,442 with 66 from Lunenburg; 280 middle school students are exploring different vocations
   - Service Level Team – committee met on 10/25; Loxi Calmes and Dave Rief presented some budget data indicating loss of ARRA funds are putting pressure on budget; looking at a model that uses data from comparative communities; primary metric agreed on is per pupil spending and MCAS performance; JM feels FinComm should spend some time discussing how we feel about service levels so JM and ME know what views to promote on behalf of FinComm at the meetings; scheduled to meet again on 11/17 at 7 pm
   - Public Safety – SG will be the new representative from FinComm
4) New Business
   - DPW Pavement Management Plan presented by DPW Director – HANDOUTS included: Pavement Survey and Maintenance Program, Street Ranking Spreadsheet, Asphalt Patching Program, Pavement Management Plan
   - Notes from presentation: 87 miles of paved roads valued at $700,000 per mile; plan is based on the functional class of the road and the number of defects; Road Classification System Survey Form used to determine priority, i.e., local road will never be a higher priority than a main road; source of survey data is VHB (one of the top engineering firms in the state, guru of pavement management plans); used VHB's methodology to create our own in-house model; a reasonable spend per year as recommended by the DPW Director is $800K
5) Next meeting – November 10; Special Town Meeting, December 5
6) Adjournment – JM made a motion to adjourn at 8:57 pm, SG seconded; all in favor

Minutes respectfully submitted by Martha McDonald

LUNENBURG DEPARTMENT OF PUBLIC WORKS

Engineering
$30K + $35K every other year

Outsource
- Crack Seal
- Paving

PAVEMENT SURVEY AND MAINTENANCE PROGRAM

Prep Work +
Drainage +
Police Detail +

Insource
- Pot holes

$700,000/mi
~86 mi
$20M total to fix all
Chap 90 $320K Town: $70K
$329,794 FY11

Highway Classification System (Functional Classes)

1. **Main Road** – Typically contains high traffic volume, and either permits traffic flow from one main road to another, or acts as an inter-town connector between the two. **Example: Lancaster Avenue**

2. **Secondary Main Road** – Typically contains higher traffic volume than either a collector road or a local road with less volume than a main road, also acting as a connector between main roads. **Example: Sunnyhill Road**

3. **Collector Road** – Typically contains lower traffic volume than either secondary main roads or main roads and permits traffic flow between main roads or secondary roads and local roads. **Example: Hollis Road**

4. **Local Road Over 1000 ft.**– Typically contains the lowest traffic volume of all roads and either permits traffic flow from any of the above roads to residential sub-divisions or acts as a connector between sub-divisions. **Example: Broadmeadow Drive**

5. **Local Road Under 1000 ft – Example: Windermere Drive**

ROAD CLASSIFICATION
#1 Lunenburg's Main Roads

- Chase Road/Rt 13/Electric Avenue
- Lancaster Avenue
- Leominster Road
- Leominster/Shirley Road
- Townsend Harbor Road
- New West Townsend Road
- Summer Street
- Northfield Road
- Reservoir Road

ROAD CLASSIFICATION
#2 Lunenburg's Secondary Main Roads

- West Townsend Road
- Holman Street
- Flat Hill Road
- Goodrich Street
- Lakefront
- Mulpus Road
- Main Street
- Pioneer Drive
- Sunnyhill Road
- West Street
- Whalom Road
- White Street

ROAD CLASSIFICATION
#3 Lunenburg's Collector Roads

- Arbor Street
- Beal Street
- Burrage Street
- Chestnut Street
- Eastern Avenue
- Elmwood Avenue
- Hollis Road
- Highland Street
- Howard Street
- Kilburn Street
- Oak Avenue
- Page Street
- Pine Street
- Pleasant Street
- Pratt Street
- Prospect Street
- School Street
- Sunset Lane
- Turkey Hill Road
- Upland Avenue
- Whiting Street
- Young's Road

ROAD CLASSIFICATION
#4 Lunenburg's Local Roads
(over 1000 ft. +/-) (SAMPLE)

- Broadmeadow Drive
- Canterbury Drive
- Connel Drive
- Cove Road
- Charlton Street
- Easterbrook Road
- Fairview Road
- Fish Street
- Bigson Street
- Gilchrest Street
- Hemlock Drive
- Horizon Island Road
- Houghton Mill Road
- Island road
- Laurel Lane
- Longwood Drive
- Maple Parkway
- May's Field Road
- Old Farm road
- Penninsula Drive
- Pierce Avenue
- Pine Acres Road
- Pine Grove Road
- Richards Way
- Robbs Hill Road
- Rolling Acres Road

ROAD CLASSIFICATION
#4 Lunenburg's Local Roads
(Under 1000 ft. +/-) (SAMPLE)

- Andrew Terrace
- Autumn Drive
- Baker Street
- Beachview Drive
- Birth Island Way
- Boucher Road
- Brookview Terrace
- Brown Avenue
- Burke Street
- Cliffview Terrace
- Clifton Road
- Country Road
- Cove Terrace
- Crescent Road
- Crescent Terrace
- Crest Avenue
- Crocker Avenue
- Cushing Lane
- East Street
- Elizabeth Street
- Fitchview Avenue
- Florence Street
- Francis Avenue
- Gabes Place

What type of road defects were looked at in the survey...

- Random/Longitudinal Cracks
- Utility Cuts/Other Patches
- Raveling, Shoving, Pushing
- Main Line Trenches
- Pot Holes
- Rutting
- Alligator Cracks

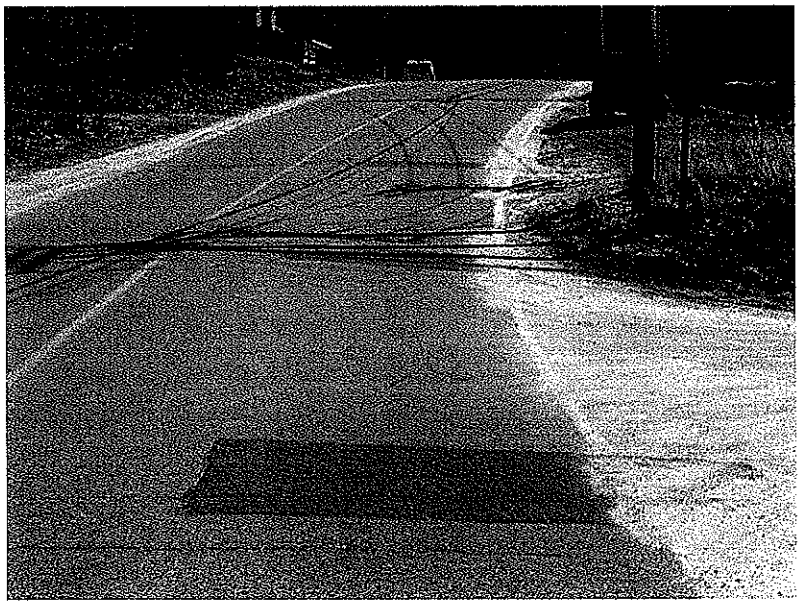
Random/Longitudinal Cracks

- Random cracks are transverse cracks caused by seasonal elongation and contraction of the pavement. These will occur within a few years of any new bituminous pavement.

Utility Cuts/Other Patches

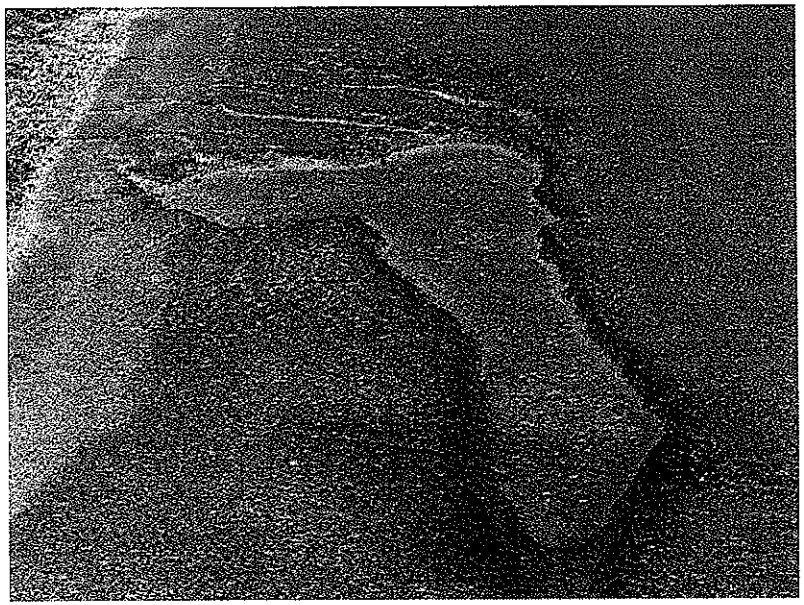
- These are sections of pavement that have been repaired with new bituminous concrete pavement.

  (i.e., small gas/water leaks)



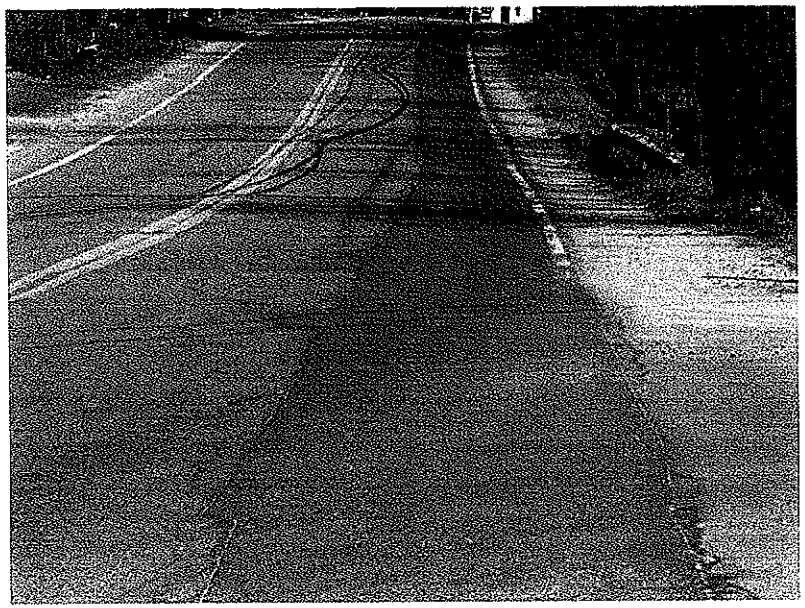
Raveling, Shoving, Pushing

- Raveling occurs when sections of the top pavement layer become loose and separate from the binder. It indicates deteriorating bond between pavement layers.



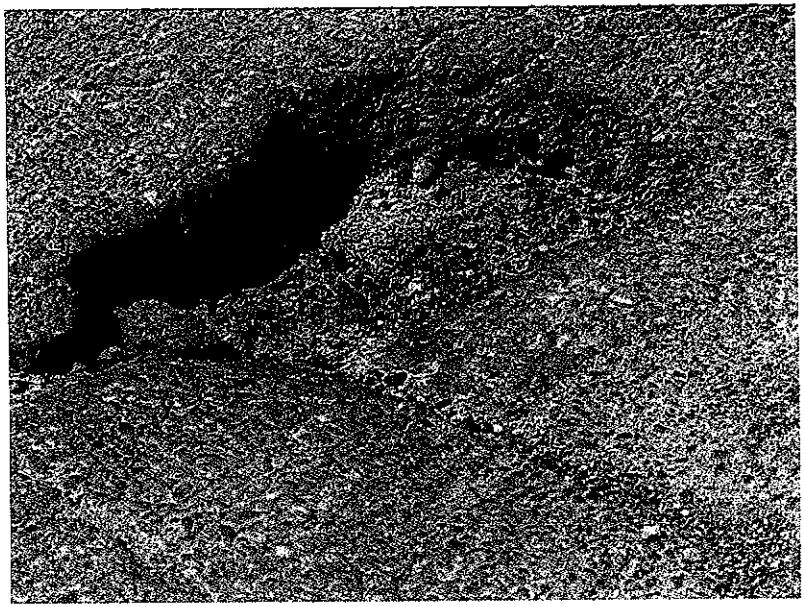
Main Line Trench

- Main line trenches are longitudinal sections of pavement that have been repaired with new bituminous concrete pavement usually after a main line utility repair.



Potholes

- A crater like hole of varying size caused by freezing and thawing of the road surface particularly in areas of other defects, cracks, etc.

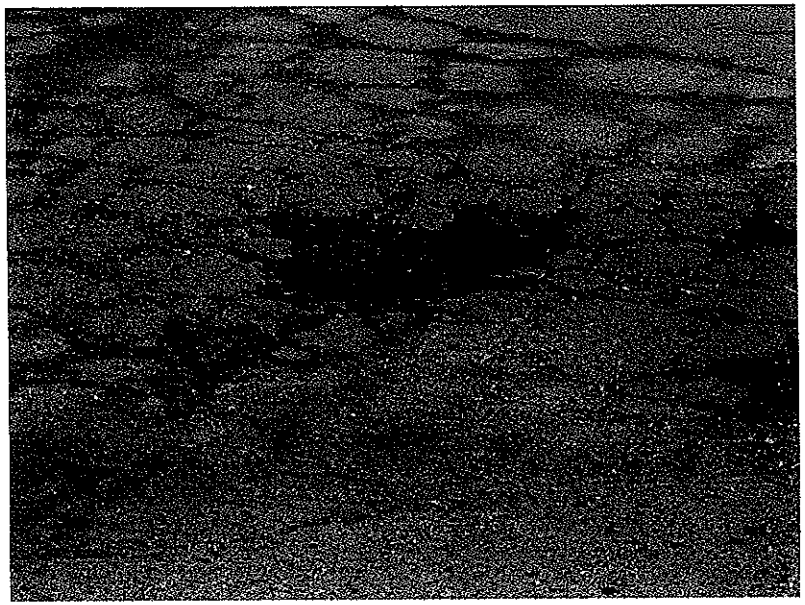


Rutting

- Longitudinal depressions, "wheel ruts", exist in travel lanes or edge of roadway. Due primarily to repetitive pressure along one line of travel causing improper sub base to compact and/or move laterally.

Alligator Cracks

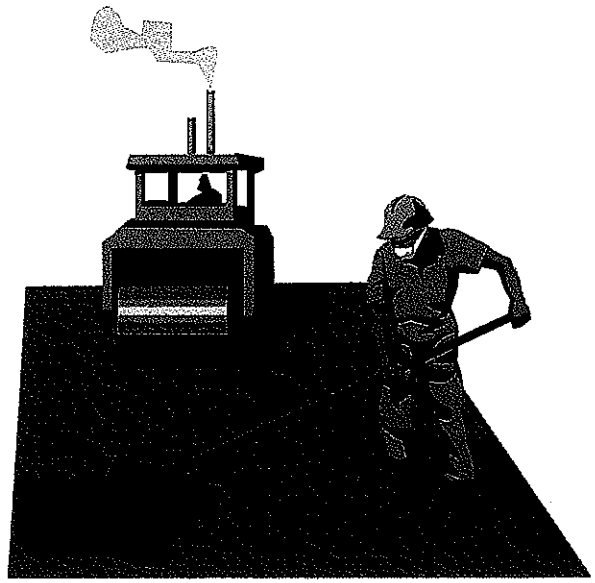
- Also called "spider webbing" & often found at or around manholes, catch basins, where driveways meet roads, and/or where the pavement is too thin or worn.



FUNDING

- The DPW resurfacing program is predicted on the State maintaining current levels of Chapter 90 funding.

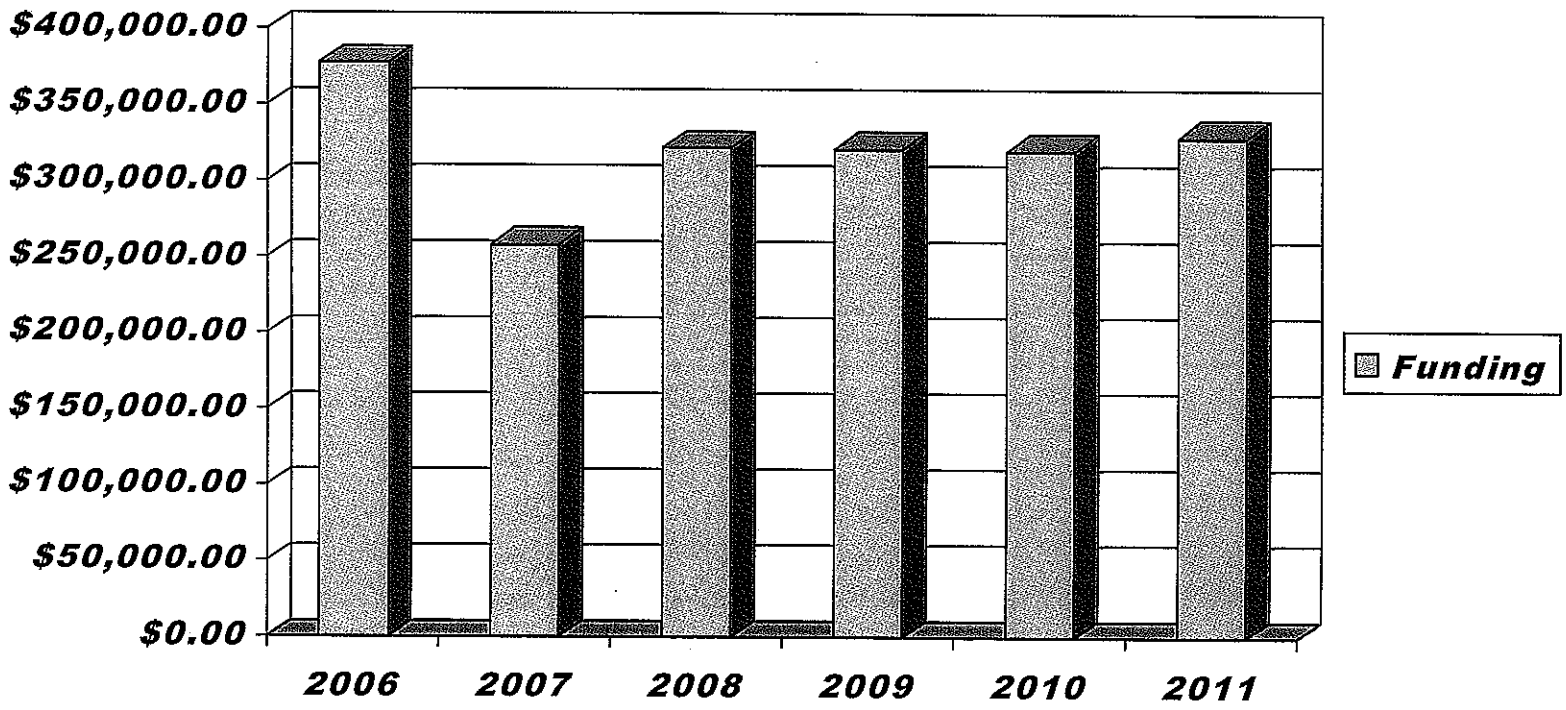
- $329,794.00 for FY11



Chapter 90 State Aid Funding History

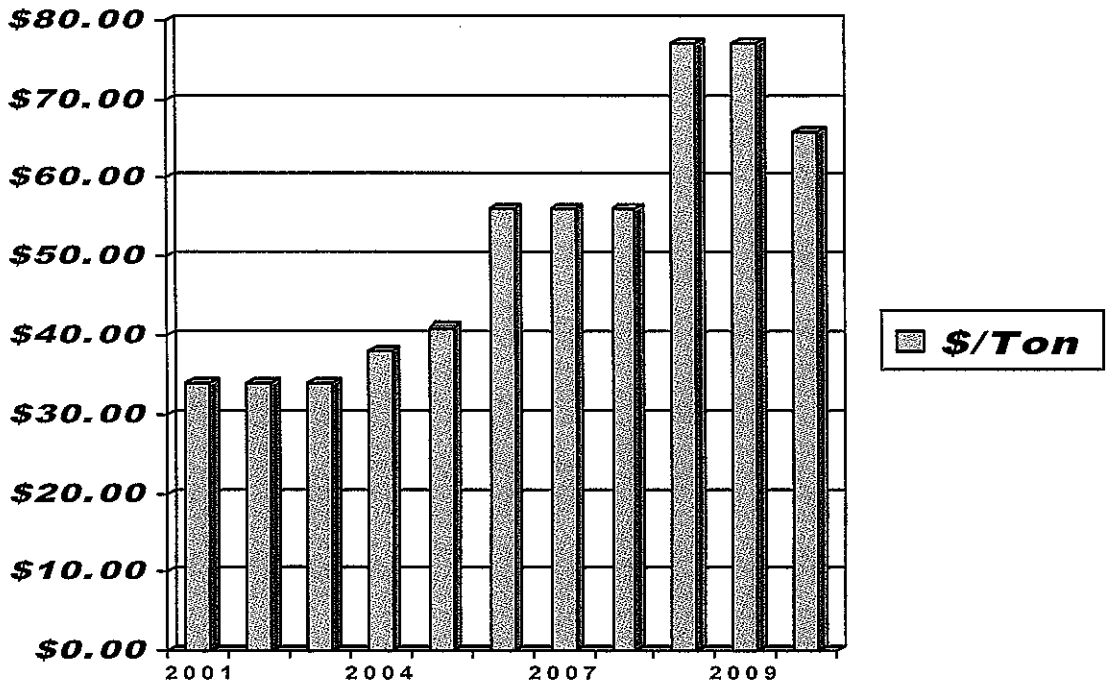
Chapt. – 291B & Sup. (FY06)	$377,704.00
Chapt. – 291C (FY07)	$258,031.00
Chapt. – 291D (FY08)	$322,432.00
Chapt. – 291D 50865 (FY09)	$321,809.00
FY10 – 50865 (No longer individual chapters)	$319,828.00
FY11 – 50865	$329,794.00

Graph of Lunenburg's Chapter 90 Funding

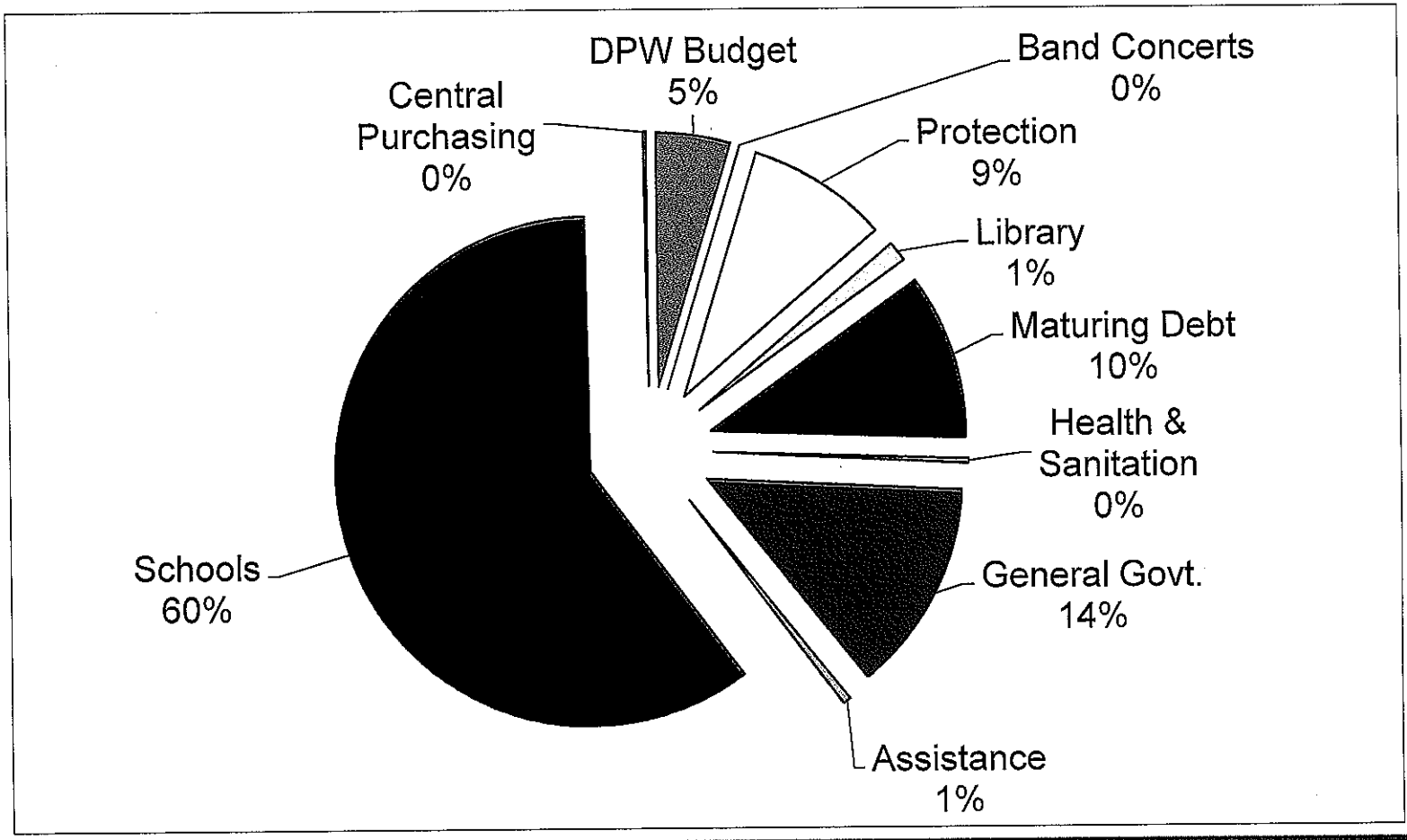


Asphalt Prices per Ton
10 Year History

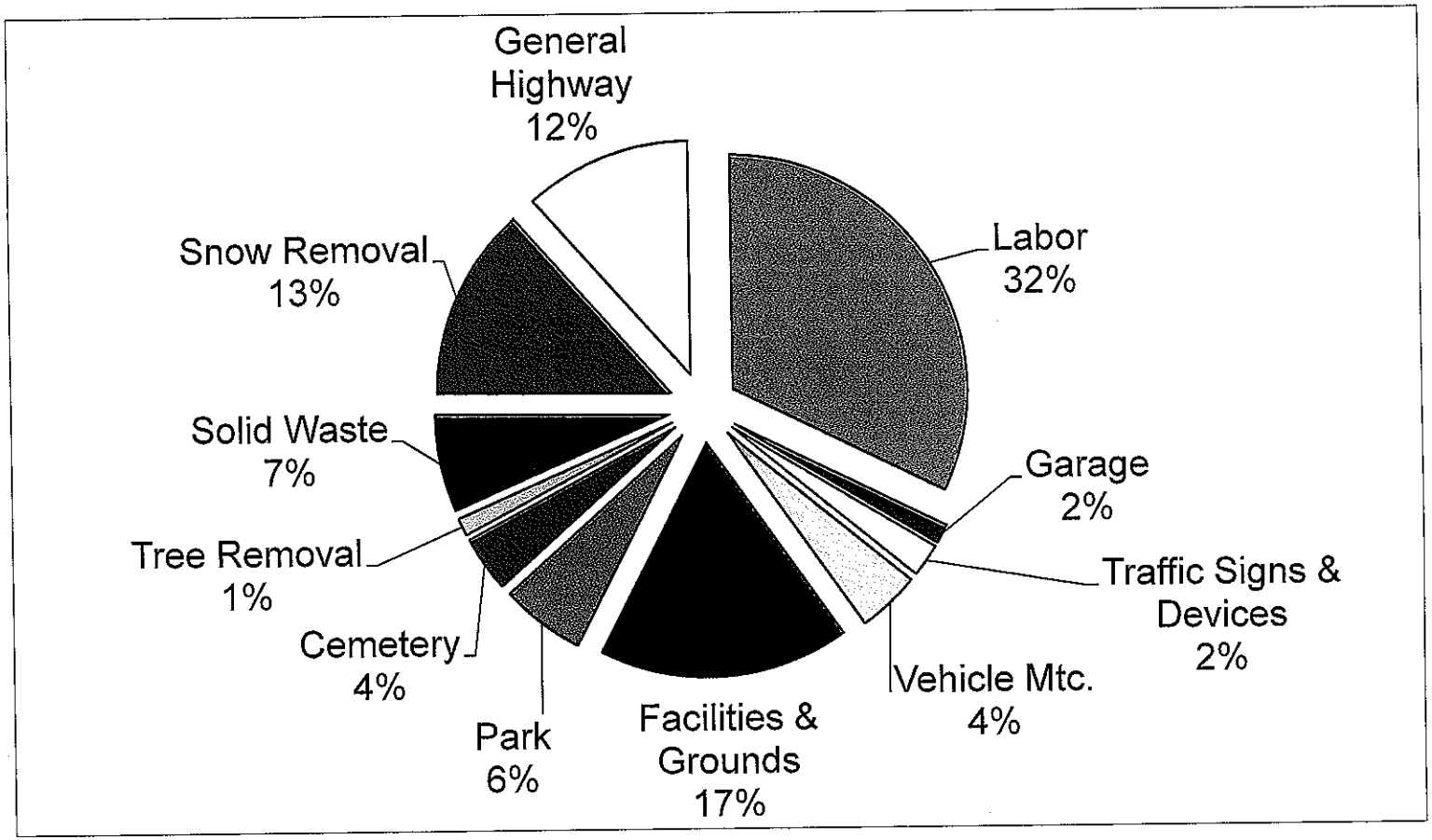
2001	$34.00
2002	$34.00
2003	$34.00
2004	$38.00
2005	$41.00
2006	$56.00
2007	$56.00
2008 (April)	$56.00
2008 (August)	$77.00
2009	$77.00
2010	$65.85



Percentage of Omnibus Budget Allocated for DPW FY09



Percentage of DPW Budget allocated for paving



NAME	WATER	SEWER	MAN-HOLES	CATCH BASINS	BEGINNING	ENDING	PVMT WIDTH	PVMT LENGTH/FT	PVMT DEF VAL	FUNCTIONAL CLASS	FUNC CLASS VALUE	PRIORITY CONDITION	APPLICATION	COST EST. FY2011
SUMMER STREET		X	14	9	FITCHBURG LINE	LEOMINSTER LINE	57	4224	35	MAIN	0.75	26.25	4" L&O	$394,602.70
NW TOWNSEND RD 2					FITCHBURG LINE @ HOWARD ST	200M NO. 557 NW TOWNSEND	22	2640	31	MAIN	0.75	23.25	4" L&O	$95,189.25
LANCASTER AVE 4					GOODRICH STREET	GIBSON STREET	22	6864	30	MAIN	0.75	22.5	4" L&O	$247,492.04
LANCASTER AVE 2					PAGE STREET	KILBURN AVENUE	24	3432	29	MAIN	0.75	21.75	4" L&O	$134,995.66
LANCASTER AVE 5					GIBSON STREET	LEOMINSTER-SHIRLEY RD	22	3168	29	MAIN	0.75	21.75	4" L&O	$114,227.10
NW TOWNSEND RD				8	TOWNSEND LINE	FITCHBURG LINE	22	2640	28	MAIN	0.75	21	4" L&O	$95,189.25
RESERVOIR ROAD				4	LEOMINSTER-SHIRLEY RD	GOODRICH STREET	30	2745.6	28	MAIN	0.75	21	4" L&O	$134,995.66
FORT POND ROAD					LANCASTER LINE	LEOMINSTER-SHIRLEY RD	28	1320	25	MAIN	0.75	18.75	4" L&O	$60,574.98
LAKEFRONT			2	9	PROSPECT STREET	LEOMINSTER LINE	52	1531.2	36	SECONDARY	0.5	18	4" L&O	$130,495.81
CHASE ROAD 2	X				C. MASS GARDEN CNTR	MASS AVENUE	39	9504	23	MAIN	0.75	17.25	4" L&O	$607,480.47
NORTHFIELD ROAD 3					MAPLEWOOD GOLF COURSE	CHASE ROAD	20	3960	23	MAIN	0.75	17.25	4" L&O	$129,803.52
CHASE ROAD	X			34	TOWNSEND LINE	C.MASS GARDEN CNTR	38	5280	22	MAIN	0.75	16.5	4" L&O	$328,835.58
NORTHFIELD ROAD 4				6	CHASE ROAD	100M SE OF GILCHREST ST	23	6072	22	MAIN	0.75	16.5	4" L&O	$228,886.87
WHITE STREET	X		4	16	MASS AVENUE	FITCHBURG LINE	24	3801.6	29	SECONDARY	0.5	14.5	4" L&O	$149,533.66
GOODRICH ST 2					RESERVOIR ROAD	WINTER HILL ROAD	18	4752	25	SECONDARY	0.5	12.5	4" L&O	$140,187.80
WEST STREET 4				4	HOLLIS ROAD	SUNNY HILL ROAD	22	2640	25	SECONDARY	0.5	12.5	4" L&O	$95,189.25
LEOMINSTER ROAD 2				22	PROSPECT STREET	200 M NORTH OF KILBURN ST	31	3696	16	MAIN	0.75	12	4" L&O	$187,782.43
RESERVOIR RD 3					FLAT HILL ROAD	297 RESERVOIR ROAD	24	1584	16	MAIN	0.75	12	4" L&O	$62,305.69
RESERVOIR RD 2					GOODRICH STREET	FLAT HILL ROAD	30	7392	15	MAIN	0.75	11.25	4" L&O	$363,449.86
RESERVOIR RD 4					297 RESERVOIR	PAGE STREET	24	4804.8	15	MAIN	0.75	11.25	4" L&O	$188,993.93
NORTHFIELD ROAD 6		X			OAK AVENUE	MASS AVENUE	23	1848	14	MAIN	0.75	10.5	2" OL	$34,830.61
W TOWNSEND RD 2				1	CHASE ROAD	262 WEST TOWNSEND ROAD	25	1584	19	SECONDARY	0.5	9.5	4" L&O	$64,901.76
HOWARD STREET				24	NEW WEST TOWNSEND+H159 ROAD	55 HOWARD STREET	26	1056	36	COLLECTOR	0.25	9	4" L&O	$44,998.55
FLAT HILL ROAD 4					RESERVOIR ROAD	SUNSET LANE	18	5280	18	SECONDARY	0.5	9	2" OL	$77,882.11
HOLMAN STREET					CHASE ROAD	1 LANE BRIDGE (MULPUS BRK)	19	2376	18	SECONDARY	0.5	9	4" L&O	$73,988.01
HOLMAN STREET 3					NORTHFIELD ROAD	HIGHLAND STREET	21	2904	18	SECONDARY	0.5	9	2" OL	$49,974.36
W TOWNSEND RD 3					262 WEST TOWNSEND ROAD	TOWNSEND LINE	25	5808	18	SECONDARY	0.5	9	4" L&O	$237,973.12
FLAT HILL ROAD 2	X				COURTLAND CIRCLE SOUTH	ELMWOOD ROAD	22	2692.8	17	SECONDARY	0.5	8.5	2" OL	$48,546.52
NORTHFIELD ROAD 5					100 M SE OF GILCHREST ST	OAK AVENUE	23	3168	11	MAIN	0.75	8.25	4" L&O	$119,419.24
FLAT HILL ROAD				3	PAGE STREET	COURTLAND CR (SOUTH)	19	2112	16	SECONDARY	0.5	8	2" OL	$32,883.56
KILBURN STREET 2	X				GOODRICH STREET	LEOMINSTER ROAD	22	1584	30	COLLECTOR	0.25	7.5	4" L&O	$57,113.55
FLAT HILL ROAD 3					SUNSET LANE	PAGE ROAD	18	4752	15	SECONDARY	0.5	7.5	2" OL	$70,093.90
WEST STREET 2			1	4	727 WEST STREET	WEST STREET EXT	20	1716	15	SECONDARY	0.5	7.5	4" L&O	$56,248.19
WHALOM ROAD 2			46	19	SUMMER STREET	ELECTRIC AVENUE	28	5808	15	SECONDARY	0.5	7.5	2" OL	$133,264.95
WEST STREET	X	X		4	ELECTRIC AVENUE	727 WEST STREET	22	2640	14	SECONDARY	0.5	7	2" OL	$47,594.62
SUNNY HILL ROAD 2	X		9	10	WEST STREET	LEOMINSTER ROAD	18	3696	13	SECONDARY	0.5	6.5	2" OL	$54,517.48
PAGE STREET 4					FLAT HILL ROAD	416 PAGE STREET	18	2692.8	25	COLLECTOR	0.25	6.25	4" L&O	$79,439.75
PAGE STREET 2					LANCASTER AVENUE	367 PAGE STREET	21	5544	24	COLLECTOR	0.25	6	4" L&O	$190,811.17
YOUNGS ROAD	X			15	WHALOM ROAD	SUMMER STREET	20	2851.2	23	COLLECTOR	0.25	5.75	2" OL	$46,729.27
W TOWNSEND RD				29	CHASE ROAD	NORTHFIELD ROAD	28	1584	11	SECONDARY	0.5	5.5	2"OL	$36,344.99

PIONEER DRIVE			6	10	LEOMINSTER-SHIRLEY ROAD	LEOMINSTER LINE	39	1056	10	SECONDARY	0.5	5	CS	$1,056.00
WHALOM ROAD	X	X	1	0	ELECTRIC ROAD	LAKEFRONT ROAD	30	950.4	10	SECONDARY	0.5	5	M&2"OL	$29,320.47
TURKEY HILL ROAD	X			12	NORTHFIELD ROAD	OAK AVENUE	21	2006.4	19	COLLECTOR	0.25	4.75	2" OL	$34,527.74
ARBOR STREET	X			1	PAGE STREET	MASS AVE	22	6652.8	18	COLLECTOR	0.25	4.5	L&O	$239,876.90
BEAL STREET	X			8	CHASE ROAD	MASS AVE	20	2640	18	COLLECTOR	0.25	4.5	2" OL	$43,267.84
BURRAGE STREET				5	PAGE STREET	FLAT HILL ROAD	20	6864	18	COLLECTOR	0.25	4.5	4" L&O	$224,992.77
HOLLIS ROAD	X			1	MASS AVENUE	WEST STREET	21	3696	18	COLLECTOR	0.25	4.5	2" OL	$63,603.72
KILBURN STREET	X			3	LANCASTER AVENUE	GOODRICH STREET	22	3696	18	COLLECTOR	0.25	4.5	2" OL	$66,632.47
MAIN STREET	X	X	6	13	MASS AVENUE	OAK AVENUE	24	1636.8	9	SECONDARY	0.5	4.5	2" OL	$32,191.27
ELECTRIC AVENUE	X	X		29	LEOMINSTER LINE	MASSACHUSETTS AVE	36	8342.4	6	MAIN	0.75	4.5	CS	$8,342.40
HOWARD STREET 2					55 HOWARD STREET	MATCH LINE 14/1277	26	792	17	COLLECTOR	0.25	4.25	4" L&O	$33,748.92
SUNNY HILL ROAD	X	X	1	8	WEST STREET	MASS AVENUE	19	3168	8	SECONDARY	0.5	4	GM	$0.00
ISLAND ROAD	X			17	SOUTH ROW ROAD	END	20	3062.4	40	LOCAL	0.1	4	4" L&O	$100,381.39
BURRAGE STREET 2					FLAT HILL ROAD	SHIRLEY LINE	23	3168	16	COLLECTOR	0.25	4	4" L&O	$119,419.24
WEST STREET 5			16	8	SUNNY HILL ROAD	LEOMINSTER ROAD	19	3168	8	SECONDARY	0.5	4	2" OL	$49,325.34
CHESTNUT STREET	X			13	MASS AVENUE	HIGHLAND STREET	18	2481.6	15	COLLECTOR	0.25	3.75	2" OL	$36,604.59
HOWARD STREET 3				3	14/1277 MATCH LINE	NW TOWNSEND ROAD	28	7128	15	COLLECTOR	0.25	3.75	CS	$7,128.00
PLEASANT STREET	X		5	18	WEST STREET	MASS AVENUE	25	5068.8	15	COLLECTOR	0.25	3.75	2" OL	$103,842.82
PRATT STREET	X			2	WEST STREET	WHALOM ROAD	20	2006.4	15	COLLECTOR	0.25	3.75	2" OL	$32,883.56
WILDERWOOD AVE		X	3	0	LEOMINSTER LINE	LEOMINSTER LINE	21	750	37	LOCAL	0.1	3.7	4" L&O	$25,813.20
WATT STREET					FLAT HILL ROAD	PAGE STREET	14	1584	35	LOCAL	0.1	3.5	FDR	$41,888.99
MAPLE PARKWAY	X			14	WHITE STREET	END	20	1372.8	34	LOCAL	0.1	3.4	FDR	$51,862.55
BROADMEADOW DR	X		2	8	WHITE STREET	PAGE HILL ROAD	29	1636.8	32	LOCAL	0.1	3.2	4" L&O	$77,795.58
PAGE HILL ROAD	X		2	6	PEARL BROOK ROAD	BROADMEADOW DRIVE	29	1003.2	32	LOCAL	0.1	3.2	4" L&O	$47,681.16
PEARL BROOK RD	X		3	4	WHITE STREET	BROADMEADOW DRIVE	29	897.6	32	LOCAL	0.1	3.2	4" L&O	$42,662.09
GIBSON STREET				2	LANCASTER AVENUE	LEOMINSTER LINE	21	1372.8	31	LOCAL	0.1	3.1	4" L&O	$47,248.48
UPLAND AVENUE	X			8	HOLLIS ROAD	ELECTRIC AVENUE	22	1372.8	12	COLLECTOR	0.25	3	CS	$1,372.80
LEOMINSTER ROAD	X	X	23	24	LANCASTER AVENUE	PROSPECT STREET	26	5808	4	MAIN	0.75	3	2" OL	$123,746.02
LAKESIDE AVENUE		X	1	1	LEOMINSTER LINE	WILDERWOOD ROAD	21	528	29	LOCAL	0.1	2.9	DEVELOPER	$18,172.49
WILDWOOD ROAD	X			8	BEACHVIEW ROAD	SOUTH ROW ROAD	20	1795.2	29	LOCAL	0.1	2.9	4" L&O	$58,844.26
KIMBALL STREET	X			4	PROSPECT STREET	POND STREET	25	686.4	28	LOCAL	0.1	2.8	4" L&O	$28,124.10
HIGHLAND STREET	X		3	5	MAIN STREET	NORTHFIELD ROAD	24	6283.2	11	COLLECTOR	0.25	2.75	2" OL	$123,572.95
CRESCENT TER	X			2	CRESCENT ROAD	END	18	369.6	26	LOCAL	0.1	2.6	4" L&O	$10,903.50
ROUND ROAD				1	RESERVOIR ROAD	END	18	4171.2	25	LOCAL	0.1	2.5	4" L&O	$123,053.74
SOUTH ROW ROAD	X				TOWNSEND HARBOR ROAD	TOWNSEND LINE	23	3801.6	25	LOCAL	0.1	2.5	4" L&O	$143,303.09
WEST GROTON RD				1	OLD MASS AVENUE	SHIRLEY LINE	24	686.4	25	LOCAL	0.1	2.5	4" L&O	$26,999.13
EASTERN AVENUE	X		2	10	ELCTRIC AVENUE	HOLLIS ROAD	30	1372.8	10	COLLECTOR	0.25	2.5	CS	$1,372.80
PAGE STREET 3					367 PAGE STREET	416 PAGE STREET	21	633.6	10	COLLECTOR	0.25	2.5	4" L&O	$21,806.99
PINE STREET	X			1	ARBOR STREET	MASS AVENUE	21	1320	10	COLLECTOR	0.25	2.5	2" OL	$22,715.62
PROSPECT STREET	X	X	11	6	LEOMINSTER ROAD	WHALOM ROAD	26	5491.2	10	COLLECTOR	0.25	2.5	CS	$5,491.20
FISH STREET	X			2	LEOMINSTER ROAD	LEOMINSTER LINE	20	1531.2	24	LOCAL	0.1	2.4	4" L&O	$50,190.69
RENNIE STREET	X				PRATT STREET	END	20	686.4	24	LOCAL	0.1	2.4	4" L&O	$22,499.28
CRESCENT ROAD	X			2	TOWNSEND HARBOR RD	SOUTH ROW ROAD	21	633.6	23	LOCAL	0.1	2.3	4" L&O	$21,806.99

PAGE STREET	X				FLAT HILL ROAD	SHIRLEY LINE	18	2745.6	9	COLLECTOR	0.25	2.25	4" L&O	$80,997.40
LEOM-SHIRLEY RD 2				9	PIONEER DRIVE	FORT POND ROAD	33	2112	3	MAIN	0.75	2.25	NEW	$0.00
CROSS ROAD	X			15	FISH STREET	PROSPECT STREET	20	5016	22	LOCAL	0.1	2.2	M&O	$185,373.53
CROSS STREET				0	MASS AVENUE	MULPUS ROAD	22	2217.6	22	LOCAL	0.1	2.2	4" L&O	$79,958.97
PIEDMONT AVENUE				0	SUMMER STREET	END	22	633.6	22	LOCAL	0.1	2.2	M&O	$14,334.45
RAMGREN ROAD	X			6	WHALOM ROAD	END	20	1056	22	LOCAL	0.1	2.2	CS	$1,056.00
SANDY COVE ROAD	X			7	SOUTH ROW ROAD	COVE ROAD	22	1848	21	LOCAL	0.1	2.1	4" L&O	$66,632.47
WILLIAMS DRIVE			4	11	ISLAND ROAD	END	24	615	21	LOCAL	0.1	2.1	4" L&O	$24,190.66
COVE ROAD	X			14	SOUTH ROW ROAD	SANDY COVE ROAD	22	2270.4	20	LOCAL	0.1	2	4" L&O	$81,862.75
OAK AVENUE	X	X	6	11	MAIN STREET	NORTHFIELD ROAD	29	2376	8	COLLECTOR	0.25	2	GM	$0.00
WHITING STREET	X	X	4	6	LEOMINSTER ROAD	MASS AVENUE	19	1689.6	8	COLLECTOR	0.25	2	CS	$1,689.60
GOODRICH STREET				2	LANCASTER AVENUE	KILBURN STREET	23	3009.6	4	SECONDARY	0.5	2	CS	$3,009.60
MULPUS ROAD	X			7	TOWNSEND HBR ROAD	SHIRLEY LINE	20	9662.4	4	SECONDARY	0.5	2	NEW	$0.00
PENINSULA DRIVE	X			5	SOUTH ROW ROAD	END	20	2904	19	LOCAL	0.1	1.9	4" L&O	$95,189.25
SAVAGE DRIVE			0	3	LEOMINSTER ROAD	END	15	316.8	19	LOCAL	0.1	1.9	2" OL	$3,894.11
AUTUMN ROAD			2	10	RESERVOIR ROAD	END	20	1531.2	18	LOCAL	0.1	1.8	4" L&O	$50,190.69
HORIZON ISLAND RD	X			1	ISLAND ROAD	END	20	1478.4	18	LOCAL	0.1	1.8	4" L&O	$48,459.98
HUNTING HILL ROAD				0	MULPUS ROAD	END	16	1742.4	18	LOCAL	0.1	1.8	2" OL	$22,845.42
CHARLTON STREET	X			8	WHITE STREET	FITCHBURG LINE	28	1161.6	17	LOCAL	0.1	1.7	4" L&O	$53,305.98
SCHOOL STREET			3	1	MASS AVENUE	END	24	170	17	LOCAL	0.1	1.7	4" L&O	$6,686.85
WILDER ROAD			0	0	LEOMINSTER LINE	CROCKER AVENUE	20	430	17	LOCAL	0.1	1.7	4" L&O	$14,094.83
WINDWARD TER	X		1	4	BEAL STREET	END	30	2112	17	LOCAL	0.1	1.7	2" OL	$51,921.41
BOUCHER ROAD				1	CHASE ROAD	END	21	1584	16	LOCAL	0.1	1.6	4" L&O	$54,517.48
COUNTRY ROAD			3	6	CHASE ROAD	END	26	739.2	16	LOCAL	0.1	1.6	2" OL	$15,749.49
CREST AVENUE	X			2	HOLLLIS ROAD	END	20	686.4	16	LOCAL	0.1	1.6	4" L&O	$22,499.28
GILCHREST STREET	X			3	NORTHFIELD ROAD	VALLEY ROAD	23	2956.8	16	LOCAL	0.1	1.6	4" L&O	$111,457.96
LAKEVIEW AVENUE	X			0	CROSS STREET	SUNSET LANE	16	528	16	LOCAL	0.1	1.6	4" L&O	$13,845.71
CANTERBURY DRIVE				9	ARBOR STREET	END	20	1256	15	LOCAL	0.1	1.5	2" OL	$20,585.00
THE LANE				13	ELMWOOD ROAD	MASS AVENUE	17	1636.8	15	LOCAL	0.1	1.5	M&O	$28,614.61
HOLMAN STREET 2					ONE LANE BRIDGE	NORTHFIELD ROAD	22	2640	3	SECONDARY	0.5	1.5	NEW/GM	$0.00
LANCASTER AVE	X	X	9	26	MASS AVENUE	PAGE STREET	28	5808	2	MAIN	0.75	1.5	NEW	$0.00
TOWNSEND HBR RD	X			13	TOWNSEND LINE	MASS AVENUE	25	9873.6	2	MAIN	0.75	1.5	NEW	$0.00
COVE TERRACE	X			2	COVE ROAD	END	20	316.8	14	LOCAL	0.1	1.4	4" L&O	$10,384.28
HOUGHTON MILL RD			7	26	RESERVOIR ROAD	END	24	4224	14	LOCAL	0.1	1.4	GM	$0.00
VALLEY ROAD	X		0	8	CLIFFVIEW ROAD	GILCHRIST STREET	22	1560	14	LOCAL	0.1	1.4	4" L&O	$56,248.19
LONGWOOD DRIVE			6	14	BURRAGE STREET	BURRAGE STREET	24	2244	13	LOCAL	0.1	1.3	2" OL	$44,133.20
ELMWOOD ROAD	X			4	MASS AVENUE	END	20	4752	5	COLLECTOR	0.25	1.25	GM	$0.00
CONNELL DRIVE	X		1	5	MASS AVENUE	END	21	730	12	LOCAL	0.1	1.2	GM	$0.00
MEMORIAL DRIVE	X	X		3	MAIN STREET	MASS AVENUE	27	844.8	12	LOCAL	0.1	1.2	GM	$0.00
PINE GROVE ROAD	X				LAKEVIEW AVENUE	CROSS ROAD	22	1267.2	12	LOCAL	0.1	1.2	4" L&O	$45,690.84
ROBBS HILL ROAD			8	8	SUNSET LANE	SHIRLEY LINE	25	3696	12	LOCAL	0.1	1.2	GM	$0.00
RUTH STREET			3	9	PARMENTER ROAD	END	24	1250	12	LOCAL	0.1	1.2	4" L&O	$49,168.00
TILTON AVENUE	X			0	MASS AVENUE	END	20	739.2	12	LOCAL	0.1	1.2	2" OL	$12,115.00

WEST STREET TER	X			9	WEST STREET	WEST STREET	20	1425.6	12	LOCAL	0.1	1.2	4" L&O	$46,729.27
BURKE STREET	X	X	5	4	NATICK STREET	JOSLIN STREET	20	739.2	11	LOCAL	0.1	1.1	GM	$0.00
CROCKER AVENUE				0	LEOMINSTER LINE	END	16	528	11	LOCAL	0.1	1.1	2" OL	$6,922.85
GRAHAM STREET	X	X	4	7	SUMMER STREET	WHALOM ROAD	23	1478.4	11	LOCAL	0.1	1.1	2" OL	$27,864.49
HILLSIDE DRIVE	X	X	2	5	MASS AVENUE	END	20	528	11	LOCAL	0.1	1.1	2" OL	$8,653.57
JOSLIN STREET	X	X	4	5	BURKE STREET	WHALOM ROAD	20	792	11	LOCAL	0.1	1.1	GM	$0.00
MAYS FIELD ROAD	X		13	10	RICHARDS WAY	END	24		11	LOCAL	0.1	1.1	NEW	$0.00
POND STREET	X			6	PROSPECT STREET	HOLLIS ROAD	24	1056	11	LOCAL	0.1	1.1	2" OL	$20,768.56
SUNSET LANE			5	20	FLAT HILL ROAD	END	24	5280	11	LOCAL	0.1	1.1	GM	$0.00
BROWN AVENUE	X			3	PLEASANT STREET	END	16	316.8	10	LOCAL	0.1	1	4" L&O	$8,307.43
CLIFFVIEW TER	X			2	VALLEY ROAD	END	19	844.8	10	LOCAL	0.1	1	4" L&O	$26,306.85
CLIFTON ROAD	X			3	WEST STREET	RANGELEY ROAD	28	633.6	10	LOCAL	0.1	1	4" L&O	$29,075.99
EAST STREET				2	YOUNGS ROAD	YOUNGS ROAD	20	739.2	10	LOCAL	0.1	1	4" L&O	$24,229.99
ELM STREET	X	X	7	2	PROSPECT STREET	SUNNYHILL ROAD	24	2376	10	LOCAL	0.1	1	GM	$0.00
FAIRVIEW ROAD	X	X	7	9	LEOMINSTER ROAD	END	20	1742.4	10	LOCAL	0.1	1	GM	$0.00
HEMLOCK DRIVE	X			10	TOWNSEND HARBOR ROAD	END	19	2798.4	10	LOCAL	0.1	1	GM	$0.00
LAUREL LANE	X	X	5	1	PROSPECT STREET	END	18	1425.6	10	LOCAL	0.1	1	GM	$0.00
LESURE AVENUE	X	X	3	5	PIERCE AVENUE	WHALOM ROAD	21	1056	10	LOCAL	0.1	1	2" OL	$18,172.49
LINCOLN STREET	X				LEOMINSTER LINE	FISH STREET	16	1003.2	10	LOCAL	0.1	1	2" OL	$13,153.42
MEADOW LANE	X		2	6	ROLLING ACRES ROAD	ROLLING ACRES ROAD	22	765	10	LOCAL	0.1	1	4" L&O	$27,583.25
PARMENTER ROAD				8	ROUND ROAD	RUTH STREET	24	625	10	LOCAL	0.1	1	4" L&O	$24,584.00
PIERCE AVENUE	X	X	8	4	LEOMINSTER LINE	ELECTRIC AVENUE	21	2428.8	10	LOCAL	0.1	1	4" L&O	$83,593.47
RANGELY ROAD	X			8	CLIFTON ROAD	REDWOOD ROAD	28	792	10	LOCAL	0.1	1	4" L&O	$36,344.99
REDWOOD ROAD	X			3	RANGELEY ROAD	WEST STREET	28	422.4	10	LOCAL	0.1	1	4" L&O	$19,383.99
RICHARDS WAY	X		18	18	MASS AVENUE	END	24	1584	10	LOCAL	0.1	1	NEW	$0.00
ROLLING ACRES RD	X		7	28	LANCASTER AVENUE	MEADOW LANE	22	3696	10	LOCAL	0.1	1	2" OL	$66,632.47
SKYLARK LANE	X			2	BEAL STREET	END	22	686.4	10	LOCAL	0.1	1	2" OL	$12,374.60
WEST ACRES DRIVE	X		3	9	WEST STREET TERRACE	WEST STREET TERRACE	22	1056	10	LOCAL	0.1	1	2" OL	$19,037.85
BAKER STREET				5	WEATHERBEE STREET	KINGMAN STREET	21	528	9	LOCAL	0.1	0.9	2" OL	$9,086.25
BROOKVIEW TER	X			6	VALLEY ROAD	END	23	897.6	9	LOCAL	0.1	0.9	4" L&O	$33,835.45
ELIZABETH STREET		X	2	3	PIERCE AVENUE	WHALOM ROAD	24	580.8	9	LOCAL	0.1	0.9	GM	$0.00
FITCHVIEW AVENUE	X			2	ELECTRIC AVENUE	END		475.2	9	LOCAL	0.1	0.9	GM	$0.00
HAMLIN STREET	X	X	2	5	BURKE STREET	WHALOM ROAD	20	844.8	9	LOCAL	0.1	0.9	GM	$0.00
JOHN STREET	X	X	3	6	WHALOM ROAD	END	19	897.6	9	LOCAL	0.1	0.9	GM	$0.00
KINGMAN STREET				4	SUMMER STREET	YOUNGS ROAD	20	633.6	9	LOCAL	0.1	0.9	2" OL	$10,384.28
NATICK STREET	X	X	2	8	WHALOM ROAD	BURKE STREET	20	739.2	9	LOCAL	0.1	0.9	GM	$0.00
OTIS STREET	X	X	1	3	WHALOM ROAD	BURKE STREET	20	792	9	LOCAL	0.1	0.9	GM	$0.00
SHAKER COURT			5	6	BURRAGE STREET	END	24	600	9	LOCAL	0.1	0.9	GM	$600.00
THE CLEARING		X	6	7	WHALOM ROAD	PIERCE AVENUE	16	792	9	LOCAL	0.1	0.9	GM	$0.00
WOODLAND DRIVE	X			16	TOWNSEND HARBOR ROAD	TOWNSEND HARBOR ROAD	20	2481.6	9	LOCAL	0.1	0.9	NEW	$0.00
ALDER WAY	X				COURTLAND CIRCLE	End	22		8	LOCAL	0.1	0.8	4" L&O	$0.00
ANDREW TERRACE	X			4	FITCHVIEW AVENUE	End	22	528	8	LOCAL	0.1	0.8	GM	$0.00
BIRCH ISLAND WAY	X			0	HEMLOCK DRIVE	END	18	792	8	LOCAL	0.1	0.8	GM	$0.00

EASTER BROOK RD			6	8	GOODRICH STREET	END	24	915	8	LOCAL	0.1	0.8	GM	$0.00
FLORENCE STREET	X	X	6	6	PIERCE AVENUE	WHALOM ROAD	22	633.6	8	LOCAL	0.1	0.8	GM	$0.00
FRANCIS AVENUE	X	X	5	3	STEVENS STREET	END		560	8	LOCAL	0.1	0.8	GM	$0.00
GABES PLACE				3	RESERVOIR ROAD	END	18	300	8	LOCAL	0.1	0.8	NEW	$0.00
HICKORY LANE	X				PINE ACRES ROAD	END	18	211.2	8	LOCAL	0.1	0.8	NEW	$0.00
JOHNSON STREET			1	2	PARMENTER/RUTH	END	24	530	8	LOCAL	0.1	0.8	4" L&O	$20,847.23
KIRBY AVENUE	X	X	2	6	WALLIS PARK	ELECTRIC AVENUE	22	615	8	LOCAL	0.1	0.8	2" OL	$11,087.38
KIRBY AVENUE 2	X	X	2		FLORENCE STREET	END	22	198	8	LOCAL	0.1	0.8	2" OL	$3,569.60
OLD FARM ROAD			7	14	NORTHFIELD ROAD	END	24	1320	8	LOCAL	0.1	0.8	NEW	$0.00
PINE ACRES ROAD	X			5	HEMLOCK DRIVE	END	18	1108.8	8	LOCAL	0.1	0.8	NEW	$0.00
ROBBS TERRACE			5	8	ROBB'S HILL ROAD	OAK RIDGE ROAD	25	988	8	LOCAL	0.1	0.8	NEW	$0.00
STEVENS STREET	X	X	2	3	LEOMINSTER ROAD	FRANCIS AVENUE	18	316.8	8	LOCAL	0.1	0.8	GM	$0.00
WALLIS PARK	X	X	1	6	WHALOM ROAD	PIERCE AVENUE	22	686.4	8	LOCAL	0.1	0.8	GM	$0.00
WEATHERBEE ST				3	YOUNGS ROAD	SUMMER STREET	21	580.8	8	LOCAL	0.1	0.8	2" OL	$9,994.87
HOLLIS ROAD 2					WEST STREET	PROSPECT STREET	21	3696	3	COLLECTOR	0.25	0.75	GM	$0.00
LEOMINSTER ROAD 3				21	200 M NORTH OF KILBURN ST	LEOMINSTER LINE	29	3696	1	MAIN	0.75	0.75	NEW	$0.00
LEOM-SHIRLEY RD				11	LEOMINSTER LINE	PIONEER DRIVE	30	1848	1	MAIN	0.75	0.75	NEW	$0.00
LEOM-SHIRLEY RD 3					FORT POND ROAD	SHIRLEY LINE	28	5808	1	MAIN	0.75	0.75	NEW	$0.00
NORTHFIELD ROAD 2					NW TOWNSEND ROAD	MAPLEWOOD GOLF COURSE	20	2112	1	MAIN	0.75	0.75	NEW	$0.00
GOODRICH ST 3					WINTER HILL ROAD	LANCASTER AVENUE	20	5280	1	SECONDARY	0.5	0.5	NEW	$0.00
SEQUOIA DRIVE			1	4	HOWARD STREET	END	23	495	4	LOCAL	0.1	0.4	NEW	$0.00
WINDERMERE DRIVE			4	6	CHASE ROAD	END	24	792	3	LOCAL	0.1	0.3	NEW	$0.00
WINTER HILL ROAD			5	8	GOODRICH STREET	END	18	1180	3	LOCAL	0.1	0.3	NEW	$0.00
NW TOWNSEND RD 3					200M NO. 557 NW TOWNSEND	FITCHBURG LINE	22	9504	0	MAIN	0.75	0	NEW	$0.00
NORTHFIELD ROAD	X	X			NEW WEST TOWNSEND	FITCHBURG LINE	20	528	0	MAIN	0.75	0	NEW	$0.00
PLEASANTVIEW AVE				7	GRAHAM STREET	END	20	528	0	LOCAL	0.1	0	NEW	$0.00
LANCASTER AVE 3					KILBURN STREET	GOODRICH STREET	23	3168	0	MAIN	0.75	0	NEW	$0.00
MASS AVE	X	X							0	STATE		0	STATE OWNED	$0.00
WEST STREET 3					ELECTRIC AVENUE	HOLLIS ROAD	19	1848	0	SECONDARY	0.5	0	NEW	$0.00

Town of Lunenburg
Department of Public Works

Lunenburg, Massachusetts

ASPHALT PATCHING PROGRAM

Prepared By: The Department of Public Works
July, 2010

OVERVIEW

The Lunenburg Department of Public Works has developed an asphalt patching program to meet the needs of our community. Our desire is to provide and maintain the highest possible level of service with quality, efficiency, and safety in mind.

Our Town consists of approximately 86 miles of streets, and quality maintenance seems to be a never ending task. Patching of streets occurs for the following reasons: filling potholes, repairing failing drainage structures, repairing access cuts for underground utility replacement or repair, as well as preparing streets for crack sealing, overlays, etc.

With a solid work plan we feel we can improve our productivity, efficiency, and customer service.

OBJECTIVES

One of the objectives of the Department of Public Works is to provide a plan for the safe and orderly movement of emergency equipment, vehicle traffic and pedestrians through the Town.

The Asphalt Patching Program was developed to facilitate this objective.

The procedures presented in this program serve to outline the maintenance provided to the citizens.

POLICIES

It is the policy of the Department of Public Works to:

1. Inspect all roadway surface areas for cracking, potholing, or any other form of degradation. This inspection process shall be considered an on-going event, and all bad areas will be noted for replacement

2. Prior to each construction season a review of work zone safety will be required New personnel shall also be trained in proper patching techniques. All equipment will be tested for proper operation and all supplies will be restocked to avoid shortages.

3. Every effort will be made to address pothole complaints within 48 hours after notification. All calls and responses will be logged.

RESPONSIBILITIES

ADMINISTRATIVE/SUPERVISORY RESPONSIBILITIES

- Supervisors spot check crew to see that quality and safety standards are being met.
- Supervisor shall maintain a good communication network with Director and other Departments concerning special requests, service cut patching, etc.
- Supervisor shall also assist crew with permit coordination if necessary, i.e., digsafe.
- Location as well as date of repair will be documented.

CREW RESPONSIBILITY

- Initiate work zone setup and patching in a safe and efficient manner.
- Assure that proper permits and paperwork are completed and logged.
- Traffic disruption should be minimized.
- Tools and equipment should be maintained to the highest standard practical.

PROCEDURES FOR UTILITY PATCHING

Proper permits and data sheets are generated within Town Departments. Permit locations are coordinated to maximize team productivity. High volume streets are patched as a priority.

Traffic control is set up with control devices in proper sequence. Visually inspect traffic flow.

Area to be patched is removed with the most efficient cutting tool for the job: jack hammer, or cutting saw.

Remove temporary or defective asphalt from area to be patched. Main streets are dug to a 4 inch dept. Apply asphalt bonding agent around edge of patch. If base under roadway is inadequate remove to depth where material becomes firm. Refill hole with proper road base and compact.

Lay 2 inches of asphalt in hole to be patched, rake level, then compact. Add another layer of asphalt to be raked level and compacted so that finished product is level with

existing asphalt. When patch is complete, it must be smooth and meet defined compaction standards.

Compaction standards are met with the use of a steel wheel roller. Edges of patches are trimmed to prevent damage and future potholing. Cleaned edges also present a much neater appearance.

Work area is swept so any loose material doesn't become a traffic hazard.

Remove traffic control devices in reverse order as was set up at start of job.

PROCEDURES FOR POTHOLE PATCHING

Pothole crews respond on an as needed basis. Potholes form in roadways after moisture has saturated asphalt surfaces causing a breakdown in asphalt.

The pothole must be clean of all debris, water, loose rock, and broken asphalt. A street broom is used to sweep out smaller particles and clean edges of hole to be patched.

Fill hole with asphalt, mix one to two inches higher than road surface. Asphalt mix is then wheel rolled with truck tire or compacted with vibratory compactor. Finished patch should be level with road surface.

On alligator cracks where asphalt breakdown is occurring, area is sprayed with a tack oil. Area is then covered completely with asphalt mix and compacted to grade. However, this procedure is only a temporary fix.

Larger cracks in roadways are filled one half of an inch higher than road surface and then compacted to grade.

TOWN OF LUNENBURG

DEPARTMENT OF PUBLIC WORKS

PAVEMENT MANAGEMENT PLAN

Pavement Management Plan
June 2010

PAVEMENT MANAGEMENT PLAN

At the request of the Board of Selectmen the Lunenburg Department of Public Works is pleased to present this Pavement Management Plan (PMP). This report details the reasons for undertaking a PMP, the process of data collection, how street repairs are prioritized, and other factors associated with maintenance of paved roads in Lunenburg.

Background on Roadway Infrastructure

Over the years, the Town has made a significant financial investment in its infrastructure. This infrastructure includes school and municipal buildings and the multi-year sewer project. Often overlooked but no less important, the roadway network is part of the Town's overall infrastructure. Like any piece of the infrastructure, the roadway network must be maintained in order to protect the public's investment. Deferring maintenance on the road system will only increase costs over time as the condition of the asset further deteriorates.

The Town maintains approximately 100 miles of roads. Current road construction estimates put the cost of reconstruction at approximately $700,000 per road mile. With 100 miles of road, this asset has a value of about $70 million. Unfortunately, the Town's financial resources for maintenance are limited to Chapter 90 State assistance and locally budgeted funds. Chapter 90 provides about $320,000 per year and the FY10 budget commits $70,000 for road improvements tools and materials. It should be noted that the General Highway Maintenance line within the departmental budget has been drastically reduced, often times mid-year due to reductions in local aid further postponing necessary maintenance.

Like many communities, the Town has not kept pace with the maintenance of its roads. Competing interests like public education, public safety, and general government operations often take priority over roadway improvements. Roadway improvements prioritized according to the squeaky wheel principle have been the norm, but is not a prudent, cost effective, or objective approach to maintaining such a valuable asset.

Furthermore, continued deferred maintenance will cost the Town dearly in the future. The cost of bituminous concrete (asphalt) has increased approximately 2 ½ times over the past 10 years. Although some costs may be slightly lower due to the current economic slump, there is no reason to believe paving costs will decline in the future.

The Board of Selectmen clearly understands the need to protect the roadway infrastructure and invest in its maintenance. For this reason the Board instructed staff to prepare a pavement management plan. As the Board rightly acknowledges, this investment needs to be done as efficiently and cost effectively as possible and it must be done in a systematic fashion. A Pavement Management System is the best way to facilitate this.

Pavement Management System

A Pavement Management System provides an objective way of programming roadway improvements with the goal of maximizing available resources and extending the life of the pavement system. The system establishes a baseline condition of roadways which is used to

establish a list of prioritized improvement recommendations. Roadway segments are prioritized according to a formula that includes the following:

- Functional Classification
- Pavement Defect Value

How the plan was prepared

The first step in preparing the PMP was to evaluate the current condition of each road or road segment. Longer roads are broken into segments reflecting past paving history and to facilitate manageable evaluation. A survey form was created to collect data on each roadway segment. The data on the survey form was then used to establish a priority ranking.

The public works industry uses two primary factors when evaluating pavement conditions: functional classification and pavement defects. Each is discussed below:

Functional classification: Roads are classified in a hierarchy according to how they are used. The functional classification is primarily a reflection of the volume of traffic a road accommodates. For the purposes of this PMP the following classes of roads are identified:

- **Main Road**: Typically contains high traffic volume and either permits traffic flow from one main road to another or acts as an inter-town connector. Example: Lancaster Avenue.
- **Secondary Main Road**: Typically contains higher traffic volume than either a collector road or a local road with less volume than a main road, also acting as a connector between main roads. Example: Sunny Hill Road.
- **Collector Road**: Typically contains lower traffic volume than either secondary main roads or main roads and permits traffic between main roads or secondary main roads and local roads. Example: Hollis Road.
- **Local Road**: Typically contains the lowest traffic volume of all roads and either permits traffic flow from any of the above roads to residential subdivisions or acts as a connector between subdivisions. Example: Broadmeadow Drive.

Pavement Defect Value: With the exception of newly paved roads, virtually all roads have some defects. The PMP evaluates a number of defect types and the prevalence of those defects. Roads with more defects and/or defects over a greater percentage of their length achieve a higher pavement defect value. The pavement defects we evaluated include:

- **Random Cracks**: Transverse cracks caused by seasonal elongation and contraction of pavement. These will occur within a few years of any new bituminous pavement.
- **Transverse/Longitudinal Cracks**: Similar to random cracks, these lengthwise and crosswise cracks are caused by seasonal elongation and contraction of pavement. These will occur within a few years of any new bituminous pavement.
- **Alligator Cracks**: Also called "spider webbing" and often found at and around manholes, catch basins, and/or driveways where they meet the road.
- **Pot Holes**: A crater like hole of varying size caused by freezing and thawing of the road surface particularly in areas of other defects and cracks.
- **Raveling**: Raveling occurs when sections of the top pavement become loose and separate from the binder course. It indicates deteriorating bond between pavement layers.

- **Rutting, Corrugations, or Pushing**: Longitudinal depressions and "wheel ruts" exist in travel lanes or the edge of the roadway. They are due primarily to repetitive pressure along one line of travel causing improper sub-base to compact and/or move laterally.
- **Cross Trenches, Utility Cuts, or other Patches**: These are sections of pavement that have been repaired with new bituminous pavement.
- **Main Line Trenches**: Main line trenches are longitudinal sections of pavement that have been repaired with new bituminous concrete pavement usually after a main line utility repair.

Survey Forms: The functional classification and pavement defect values were arrived at by using the Road Classification System Survey Form attached to this report. Each road or road segment was evaluated and a survey form filled out for each. The Pavement Defects section of the form shows the types of defects evaluated and the intensity of those defects. Column 1 indicates no defect. Moving left to right the columns indicate progressively higher defects, reflecting the percentage of the road that suffers from the particular defect. Column 6 represents the severest defect. The values of each defect, ranging from 1 to 6, are added together to give the Pavement Defect Value, which is listed at the bottom of the survey form. A low pavement defect value indicates a road in good condition while a high pavement defect value indicates a road in poor condition.

Priority Condition: Pavement defect value alone will not provide a useful priority list for road repair. Using both pavement defect value and road classification provides a more useful and informed outcome. It is necessary to give a weighted value to the road classification so that roads with a higher classification receive the attention they deserve. For the Pavement Management Plan, the following values were applied:

- Main Road: 0.75
- Secondary Main Road: 0.50
- Collector Road: 0.25
- Local Road: 0.10

Multiplying the pavement defect value by the road classification values provides the priority condition value.

Pavement defect value X functional classification value = priority condition value

This provides a priority value for each road or segment. All of the roads/segments can then be sorted by the priority value to provide a priority list of roads.

Improvement Methods

Once Overall Priority Conditions for each roadway segment are completed specific improvement methods are identified. The Annual Improvement Plan will be designed taking into consideration available funds and the roadway network as a whole. The improvement program will address immediate needs and long term maintenance of the roadway network. Immediate needs are those in which roadway segments are at or near failure. Long term maintenance needs are those that slow or stop the deterioration of the roadway segment, thereby extending the life of the segment.

Improvements will be tailored to the specific condition of the roadway segment. Improvements may include crack sealing, patching, replacing broken berms, shoulder work, infrared repairs, trench repairs, milling, overlay, and total or partial reclamation or reconstruction. Other roadway features will also be evaluated and factored into improvement costs prior to a specific overall cost estimate. These may include curbing, manholes, and general drainage repairs including catch basins. The most typical pavement application allows for the use of existing pavement and sub base as the foundation for a leveling course which serves to reshape the roadway profile. Due to the rutting of the failed surface this course is difficult to measure. Once this phase of the reconstruction is complete a top course is installed consisting of two inches of bituminous concrete consisting of slightly smaller aggregate.

Preventive Maintenance

In addition to addressing roads in poor or failing condition, an emphasis must be placed on preventive maintenance. It is important to address pavement problems as they develop and not allow them to reach the point of pavement failure. For this reason, minor repair techniques will be utilized to extend the life of roadways. For example, crack sealing is a fairly inexpensive way to prevent water from infiltrating into pavement, which can quickly lead to pavement failure.

Reconstruction

For roadways that are beyond repair, reconstruction will be necessary. In general, reconstruction should only be considered for main roads. This is because of the volume of traffic these roadways carry. It is generally not cost effective to reconstruct secondary and local roadways that do not carry heavy volumes. These roads can usually be sufficiently repaired by less costly means.

Annual Improvement Program

Every year prior to the commencement of the construction season a list of roadway improvements will be published. This Annual Improvement Program will be provided to the Board of Selectmen and made available to the public on the Town's website. The program will detail the roadway segments and the corresponding pavement method for each segment. The decisions will be directly tied to the Pavement Management Program. Due to uncertain funding and expenses it is difficult to develop a list that projects when each roadway segment will be addressed. Multiyear improvement schedules will be released to the extent that they can be accurately projected.

Summary

A Pavement Management Program that incorporates roadway functional classification and pavement defect value provides an objective way of evaluating and prioritizing necessary roadway repairs. As noted above, roadway maintenance is funded from two sources: State c. 90 funding at approximately $320,000 per year and local funds at about $70,000 per year. That is not a lot of money to maintain an asset valued at approximately $70,000,000. Absent an infusion of additional funds we must assume this is our annual allocation. Therefore, we must be as efficient as possible with our available funds. Adherence to the Pavement Management Program will give us the best ability to maintain this asset in as efficient a means as possible.

VHB Engineering Model
(They wanted $30K which made us do in-house

ROAD CLASSIFICATION SYSTEM SURVEY FORM

Street Name _____ **Survey Date** _____

Section Beginning _____ **Pavement Width** _____ feet

Section Ending _____ **Pavement Length** _____ feet

Functional Class

.75 1. Main Road ☐

.5 2. Secondary Main ☐

.25 3. Collector ☐

.1 4. Local ☐

Other Features

	Yes	No
1. Curbing/Berm	☐	☐

Utilities _____

Manholes _____

Catch Basins _____

Proposed Repair (H, M, L, N)

1. Routine Maintainance
   - a. Crack filling _____
   - b. Patching _____
   - c. Replace broken berm _____
   - d. Shoulder work _____
   - e. Infra-red repairs _____
   - f. Trench repairs _____
2. Level & Overlay _____
3. Complete Reconstruction _____
   - a. Total reclamation _____
   - b. Partial reclamation _____

Pavement Defects	1 0%	2 1-10%	3 11-25%	4 26-50%	5 51-75%	6 76-100%
1. Random Cracks	☐	☐	☐	☐	☐	☐
2. Transverse/Longitudinal Cracks	☐	☐	☐	☐	☐	☐
3. Alligator Cracks	☐	☐	☐	☐	☐	☐
4. Pot Holes	☐	☐	☐	☐	☐	☐
5. Raveling	☐	☐	☐	☐	☐	☐
6. Rutting, Corrugations, or Pushing	☐	☐	☐	☐	☐	☐
7. Cross Trenches, Utility Cuts, Other Patches	☐	☐	☐	☐	☐	☐
8. Main Line Trenches	☐	☐	☐	☐	☐	☐

Pavement Defect Value: _____

Comments: